AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

Claim 1 (Currently amended): A transmission system, comprising:

a plurality of ~~receivers~~ demodulators, each of the plurality of ~~receivers~~ demodulators receiving signals from one of a plurality of transmission bands, the plurality of transmission bands being transmitted on a single ~~transmission medium~~ differential conductive pair; and

a cross-channel interference canceller coupled to the plurality of ~~receivers~~ demodulators, the cross-channel interference canceller coupled to receive the signals from ~~each~~ all of the plurality of transmission bands transmitted on the differential conductive pair.

Claim 2 (Currently amended): The system of Claim 1, wherein at least one of the plurality of ~~receivers~~ demodulators comprises:

a down converter that converts an input signal from the one of the plurality of transmission bands to a base band;

a filter coupled to receive signals from the down converter, the filter substantially filtering out signals not in the base band;

an analog-to-digital converter coupled to receive signals from the filter and generate digitized signals;

an equalizer coupled to receive the digitized signals; and

a trellis decoder coupled to receive signals from the equalizer and generate recreated data, the recreated data being substantially the same data transmitted by a corresponding ~~transmitter~~ modulator.

Claim 3 (Original): The system of Claim 2, wherein the down-converter creates an in-phase signal and a quadrature signal, the in-phase signal being the input signal multiplied by a cosine function at the frequency of the one of the plurality of transmission bands and the

quadrature signal being the input signal multiplied by a sine function at the frequency of the one of the plurality of transmission bands.

Claim 4 (Original): The system of Claim 3, wherein the filter includes an in-phase filter filtering the in-phase signal and a quadrature filter filtering the quadrature signal.

Claim 5 (Original): The system of Claim 3, further including an offset block coupled between the down-converter and the filter, the offset block offsetting the in-phase signal and the quadrature signal such that signals output from the analog-to-digital converter averages zero.

Claim 6 (Original): The system of Claim 3, further including an amplifier coupled between the filter and the analog-to-digital converter, the amplifier amplifying an in-phase filtered signal from the in-phase filter and a quadrature filter signal from the quadrature filter such that the analog-to-digital converter is filled.

Claim 7 (Original): The system of Claim 6, wherein an in-phase gain of the amplifier and the quadrature gain of the amplifier are adaptively chosen in an automatic gain controller.

Claim 8 (Original): The system of Claim 7, wherein the automatic gain controller sets the in-phase gain and the quadrature gain based on the digitized signals from the analog to digital converters.

Claim 9 (Original): The system of Claim 8, wherein the in-phase gain and the quadrature gain are equal.

Claim 10 (Original): The system of Claim 3, wherein the analog-to-digital converter includes a first analog-to-digital converter coupled to receive signals from the in-phase filter and a second analog-to-digital converter coupled to receive signals from the quadrature filter.

Claim 11 (Previously presented): The system of Claim 2, further including a correction circuit coupled between the analog-to-digital converter and the equalizer.

Claim 12 (Original): The system of Claim 11, wherein the correction circuit includes an adjustment to correct phases between the in-phase signal and the quadrature signal.

Claim 13 (Currently amended): The system of Claim 12, wherein a ~~small portion of~~ the correction includes that a first coefficient times one of the in-phase signal and the quadrature signal ~~are~~ is added to the opposite one of the in-phase signal and the quadrature signal.

Claim 14 (Currently amended): The system of Claim 13, wherein ~~a second portion of~~ the correction includes that a second factor times the opposite one of the in-phase signal and the quadrature signal is added to the opposite one of the in-phase signal and the quadrature signal.

Claim 15 (Current amended): The system of Claim 14, wherein the ~~small portion and the second portion~~ first factor and the second factor are adaptively chosen.

Claim 16 (Current amended): The system of Claim 15, wherein the ~~small portion~~ first factor is a function of in-phase and quadrature output signals from the correction circuit.

Claim 17 (Currently amended): The system of Claim 16, wherein the second ~~portion~~ factor is a function of the ratio between in-phase and quadrature signals from the correction circuit.

Claim 18 (Original): The system of Claim 3, wherein a phase rotator circuit is coupled between the analog-to-digital converter and the equalizer.

Claim 19 (Original): The system of Claim 18, wherein a parameter of the phase rotator circuit is adaptively chosen.

Claim 20 (Original): The system of Claim 3, wherein an amplifier is coupled between the equalizer and the trellis decoder.

Claim 21 (Original): The system of Claim 20, wherein a quadrature correction is coupled between the amplifier and the trellis decoder.

Claim 22 (Original): The system of Claim 21, wherein an offset circuit is coupled between the quadrature correction and the trellis decoder.

Claim 23 (Original): The system of Claim 20, wherein an in-phase gain and a quadrature gain of the amplifier are adaptively chosen from error signals calculated from sliced values.

Claim 24 (Original): The system of Claim 23, wherein the sliced values are determined from input signals to the trellis decoder.

Claim 25 (Original): The system of Claim 21, wherein a parameter of the quadrature correction is adaptively chosen.

Claim 26 (Original): The system of Claim 22, wherein a parameter of the offset circuit is adaptively chosen.

Claim 27 (Original): The system of Claim 2, wherein the equalizer is a complex equalizer executing a transfer function, the transfer function having parameters $C_k^x(j)$ and $C_k^y(j)$ where j is an integer.

Claim 28 (Currently amended): The system of Claim 2, wherein the equalizer is a complex equalizer executing a transfer function, the transfer function having parameters $C_k^{x,I}(n)$, $C_k^{y,I}(n)$, $C_k^{x,Q}(n)$ and $C_k^{y,Q}(n)$, where n is an integer indicating the clock cycle, and k is an integer indicating the ~~channel~~ transmission band.

Claim 29 (Original): The system of Claim 27, wherein the center parameters $C_k^x(0)$ and $C_k^y(0)$ are fixed.

Claim 30 (Original): The system of Claim 29, wherein $C_k^x(0)$ is one and $C_k^y(0)$ is zero.

Claim 31 (Original): The system of Claim 29, wherein the parameters $C_k^x(-1)$ and $C_k^y(-1)$ are fixed.

Claim 32 (Currently amended): The system of Claim 1, wherein the cross-channel interference canceller provides transfer functions coupled between pairs of ~~channels~~ transmission bands so that each of the plurality of ~~channels~~ transmission bands can be corrected for cross-channel interference.

Claim 33 (Original): The system of Claim 32, wherein the transfer functions includes one or more time delays.

Claim 34 (Original): The system of Claim 32, wherein coefficients of the transfer functions are adaptively chosen.

Claim 35 (Original): The system of Claim 1, wherein an operating frequency of the plurality of receivers is adjusted to match that of a corresponding plurality of ~~transmitters~~ modulators transmitting data into the transmission bands.

Claim 36 (Currently amended): A method of transmitting data, comprising:

receiving a transmitted signal from a ~~transmission medium~~ single conductive pair into a plurality of ~~receivers~~ demodulators;

each of the plurality of ~~receivers~~ demodulators down-converting the transmission signal by a set carrier frequency to receive one of a plurality of transmission bands; and

cancelling the cross-channel interference in each of the plurality of ~~receivers~~ demodulators by correcting each received signal corresponding to the plurality of transmission bands with signals received from all of the other ones of the plurality of demodulators.

Claim 37 (Currently amended): The method of Claim 36, wherein cancelling the cross-channel interference in each of the plurality of ~~receivers~~ demodulators includes:

receiving equalized signals from each of the plurality of ~~receivers~~ demodulators; and

subtracting components of the equalized signals from each of the plurality of ~~receivers~~ demodulators from the received signal in each of the other demodulators ~~receivers~~.

Claim 38 (Currently amended): The method of Claim 37, wherein subtracting components of the equalized signals includes providing a transfer function between each of the plurality of ~~receivers~~ demodulators.

Claim 39 (Original): The method of Claim 38, wherein the transfer function includes a multi-tap transfer function.

Claim 40 (Original): The method of Claim 39 wherein coefficients of the transfer function are adaptively chosen.

Claim 41 (Currently amended): A transmission system, comprising:

means for transmitting data into multiple channels on a ~~transmission medium~~single differential conductive pair, each of the multiple channels having a carrier frequency;

means for receiving data from the ~~transmission medium~~single differential conductive pair;

means of down-converting data from each of the multiple channels;

means for digitizing the data from each of the multiple channels;

means for equalizing the data from each of the multiple channels to correct for intersymbol interference;

means for correcting the data from each of the multiple channels for cross-channel interference, the means for correcting including means for receiving data from all of the other multiple channels; and

means for providing recovered data based on the corrected and equalized data from each of the multiple channels.